

I claim:

1. An integrated actuator for an optical switch mirror array comprising:
means for applying a tilting force to a mirror, against an underside thereof and against a fin extending from said underside for developing an initial tilt position of said mirror as it rotates about a torsion beam; and
means for applying a pull-in force to complete the tilt of said mirror to its final optical switching position beyond said initial tilt position in the mirror array.

2. The actuator of claim 1 wherein said means for applying said tilting force comprises an air blast apparatus providing said force as a pulse.

3. The actuator of claim 1 wherein said means for applying said tilting force comprises a gas blast apparatus providing said force as a pulse.

4. The actuator of claim 1 wherein said means for applying said tilting force comprises a fluid blast apparatus providing said force as a pulse.

5. The actuator of claim 1 wherein said means for applying a pull-in force comprises an electrostatic generator for generating an electrostatic force.

6. The actuator of claim 1 wherein said means for applying a pull-in force comprises a magnetic generator for generating a magnetic force.

7. The actuator of claim 1 wherein said means for applying a pull-in force comprises a combination of electrostatic and magnetic generators for generating a combined electrostatic and magnetic force.

8. The actuator of claim 1 wherein said fin extends from said underside of said mirror in substantially perpendicular fashion.

9. The actuator of claim 1 wherein said fin extends from said underside of said mirror in an inclined fashion, to enhance and prolong the effect of the blast.

10. The actuator of claim 1 further comprising a plurality of fins extending from said underside of said mirror in combined perpendicular and inclined fashion.

11. A combined actuator for an optical switch mirror array comprising a combined actuation mechanism based upon a gas flow providing a mechanical force and an electrostatic force.

12. A combined actuator for an optical switch mirror array comprising a combined actuation mechanism based upon a gas flow providing a mechanical force and a magnetic generator providing a magnetic force.

13. A method of actuating a micro-mirror in an optical switch mirror array, said method comprising:

applying a mechanical force to bring the mirror to a tilted position, and
applying at least one of an electrostatic and magnetic force to achieve pull-in to complete the tilt of the mirror to its final optical switching position.

14. A method of actuating a micro-mirror in an optical switch mirror array, said method comprising:

applying a mechanical force to bring the mirror to a tilted position, and
applying a combination of an electrostatic and magnetic force to achieve pull-in to complete the tilt of the mirror to its final optical switching position.

15. The method of claim 14 wherein said combined electrostatic and magnetic force achieve pull-in to complete the tilt of the mirror to its final optical switching position., and wherein said magnetic force ensures latching in said final position, even if there is a power failure.